

SOL-GEL PROCESSING WITH INORGANIC METAL SALT PRECURSORS

Abstract of the Disclosure

Methods for sol-gel processing that generally involve mixing together an inorganic metal salt, water, and a water miscible alcohol or other organic solvent, preferably at room temperature. A macromolecular dispersant material, such as hydroxypropyl cellulose (HPC), may optionally be added. The resulting homogenous solution is incubated at a desired temperature and time to result in a desired product. Several parameters of the method can be manipulated, making the method highly tunable and enabling production of sols and gels with various desired characteristics. For example, variables that can be tightly controlled and which control the product characteristics include the metal salt concentration (C), ratio of organic solvent to water (RH), temperature of incubation (T), time of incubation (t), and concentration of macromolecular dispersant (such as HPC). The methods enable production of high quality sols and gels at lower temperatures than standard methods. The methods enable production of nanosize sols from inorganic metal salts. The methods offer sol-gel processing from inorganic metal salts.

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